

IN THE CLAIMS:

1. (Currently Amended) A hydraulic accumulator for storing mechanical energy comprising:

a rigid tank having an open interior;

first and second fixtures on said tank for fluid communication with gas and liquid sources exterior to said tank;

a flexible, non-elastic bladder, formed of a metal foil and in the form of a non-accordion bag, mounted within said tank and having an interior in communication with one of said fixtures, said bladder separating the open interior of the tank into a gas space and a working fluid space respectively communicating through said fixtures; and

a shut-off valve mounted in a second of said fixtures and movable from an open position to a closed position closing said second fixture, responsive to coming into contact with said bladder when the volume of the working fluid within said accumulator falls to a predetermined low value.

2. (Cancelled)

3. (Previously Presented) A hydraulic accumulator according to claim 1 wherein said gas space is defined between said tank and said bladder and contains a mass of compressed gas and wherein the working fluid is a liquid which enters and exits the interior of said bladder through said second fixture.

4. (Cancelled)

5. (Original) A hydraulic accumulator according to claim 1 wherein said interior of said bladder contains a mass of compressed gas, and wherein the working fluid is a liquid which enters and exits said working fluid space which is defined between said tank and said bladder.

6. (Cancelled)

7. (Previously Presented) A hydraulic accumulator according to claim 6 wherein said metal foil is between 0.0003 and 0.0007 inches thick.

8. (Original) A hydraulic accumulator according to claim 6 wherein said metal foil has at least one surface coated with a flexible polymer.

9. (Cancelled)

10. (Cancelled)

11. (Previously Presented) A hydraulic accumulator according to claim 1 further comprising a coil spring attached to said second fixture and external to and surrounding said shut-off valve, said coil spring, upon contact with said bladder, preventing said bladder from being extruded through said shut-off valve and preventing said bladder

from contacting the shut-off valve until the volume of the working fluid within said accumulator falls to said predetermined low value.

12. (Original) A hydraulic accumulator according to claim 1 further comprising a spring internal to the bladder and attached to opposing ends of the bladder.

13. (Cancelled)

14. (Previously Presented) A hydraulic accumulator for storing mechanical energy comprising:

a rigid tank having an open interior;

first and second fixtures on said tank for fluid communication with gas and liquid sources exterior to said tank;

a bladder, in the form of a non-accordion bag formed of a metal foil between 0.0003 and 0.0007 inches thick, mounted within said tank and having an interior in communication with one of said fixtures, said bladder separating the open interior of the tank into a gas space within the bladder and a liquid space surrounding the bladder, respectively communicating through said fixtures;

a shut-off valve mounted in a second of said fixtures and closing the second of said fixtures responsive to coming into contact with said bladder when the volume of the working fluid within said accumulator falls to a predetermined low value; and

a vent formed in said tank and in communication with said liquid space.

15. (Cancelled)

16. (Previously Presented) A hydraulic accumulator according to claim 14 wherein said second fixture provides communication between said liquid source and said liquid space.

17. (Previously Presented) A hydraulic accumulator according to claim 1 wherein said shut-off valve opens and closes a second of said fixtures, said second fixture providing communication between one of said sources and space within the interior of said tank surrounding said bladder.

18. (Previously Presented) A hydraulic accumulator according to claim 14 wherein said bladder is flexible and non-elastic.

19. (Previously Presented) A hydraulic accumulator according to claim 14 further comprising a coil spring attached to said second fixture and external to and surrounding said shut-off valve, said coil spring, upon contact with said bladder, preventing said bladder from being extruded through said shut-off valve and preventing said bladder from contacting the shut-off valve until the volume of the working fluid within said accumulator falls to said predetermined low value.

20. (Cancelled)

21. (Previously Presented) A hydraulic accumulator according to claim 1 wherein said bladder has an interior filled with a flexible open-cell foam.

22. (Previously Presented) A hydraulic accumulator according to claim 1 wherein said bladder is oversized relative to said rigid tank so that, in a completely filled state, the bladder completely fills the interior of the accumulator as defined by the inner wall surfaces of said rigid tank.

23. (Previously Presented) A hydraulic accumulator according to claim 14 wherein said bladder has an interior filled with a flexible open-cell foam.

24. (Previously Presented) A hydraulic accumulator according to claim 14 wherein said bladder is oversized relative to said rigid tank so that, in a completely filled state, the bladder completely fills the interior of the accumulator as defined by the inner wall surfaces of said rigid tank.

25. (Previously Presented) A hydraulic accumulator according to claim 1 installed in a hydraulic drive train of a hybrid motor vehicle.

26. (Previously Presented) A hydraulic accumulator according to claim 14 installed in a hydraulic drive train of a hybrid motor vehicle.